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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Bruce A. Phillips et al.

Serial No.: 09/265,214

Filed: March 10, 1999

For: xDSL-BASED COMMUNICATION SYSTEM

Attorney Docket No.: 1552 (USW 0506 PUS)

Group Art Unit: 2663

Examiner: Soon D. Hyun

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal brief from the final rejection of claims 1-21 of the Office Action dated July 3, 2003. This application was filed on March 10, 1999.

I. REAL PARTY IN INTEREST

The real party in interest is Qwest Communications International Inc.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to appellants, the appellants' legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

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III. STATUS OF CLAIMS

Claims 1-21 are pending in this application. Claims 1-21 have been rejected and are the subject of this appeal.

IV. STATUS OF AMENDMENTS

After final rejection, no amendments were filed.

V. SUMMARY OF THE INVENTION

The present invention relates to packet-based xDSL architectures for broadband communication systems. Page 1, lines 1-2. With reference to Figure 1, claim 1 recites a broadband communication system 10 using xDSL packet-based technologies. The system 10 comprises an upstream xDSL modem 20, a twisted pair 24 connected to the upstream xDSL modem 20, and a plurality of taps 26 defined along the twisted pair 24. The system further comprises a plurality of downstream xDSL modems 30, 32, 34, 36, 38. Each downstream xDSL modem is in communication with a corresponding tap of the plurality of taps 26. The upstream xDSL modem 20 and the plurality of downstream xDSL modems 30, 32, 34, 36, 38 provide packet-based point to multipoint communication between the upstream xDSL modem 20 and the plurality of downstream xDSL modems 30, 32, 34, 36, 38. Page 3, lines 5-13; page 6, lines 1-6.

Claim 2 recites that the upstream xDSL modem 20 and the plurality of downstream xDSL modems 30, 32, 34, 36, 38 are VDSL modems. Page 3, lines 14-15; page 6, lines 8-9.

Claim 3 recites that the twisted pair 24 is an unshielded twisted pair. Claim 4 recites that the twisted pair 24 is a copper twisted pair. The twisted pair 24 could be a

Category 3 twisted pair in accordance with claim 5, or a Category 5 twisted pair in accordance with claim 6. Page 3, lines 15-17; page 6, lines 14-17.

Claim 7 recites that the upstream xDSL modem 20 and the plurality of downstream xDSL modems 30, 32, 34, 36, 38 are configured for use in a packet-switched network, or alternatively, in a cell-switched network as recited in claim 8. Page 3, lines 17-20; page 6, lines 26-29.

Claim 9 recites that the system 10 wherein the plurality of downstream xDSL modems 30, 32, 34, 36, 38 are operative to transmit to the upstream xDSL modem 20 in a contention-based protocol. Page 3, lines 21-22; page 7, lines 1-5. Claim 10 further recites the system 10 wherein the plurality of downstream xDSL 30, 32, 34, 36, 38 modems are operative to transmit to the upstream xDSL modem 20 in a time division multiplexing-based protocol. Page 3, lines 21-23; page 7, lines 5-9. In addition, claim 11 recites the system 10 wherein the upstream xDSL modem 20 is preferably operative to transmit to the plurality of downstream xDSL modems 30, 32, 34, 36, 38 in a broadcast-based protocol. Page 3, lines 23-25; page 7, lines 9-11.

Claim 12 recites the broadband communication system 10 of the type utilizing xDSL packet-based technologies. The system 10 includes a central office 12 in communication with an upstream xDSL modem 20. A twisted pair 24 is connected to the upstream xDSL modem 20 and has a plurality of taps 26 defined along the twisted pair. A plurality of downstream xDSL modems 30, 32, 34, 36, 38 each being in communication with a corresponding tap of the plurality of taps 26. The upstream xDSL modem 20 and the plurality of downstream xDSL modems are configured to provide packet-based point-to-multipoint communication between the upstream xDSL modem 20 and the plurality of downstream xDSL modems 30, 32, 34, 36, 38. Page 3, lines 26-28; page 4, line 5. An alternative embodiment

of this particular combination is also illustrated in Figure 2. Page 7, lines 21-31; page 8, lines 1-21.

Claim 13 recites the system 10 wherein the upstream xDSL modem 20 is located within the central office 12. Page 4, lines 5-6. Alternatively, in reference to Figure 2, claim 14 recites a system 60 wherein the upstream xDSL modem 74 is located outside of the central office 62. The system 60 comprises a fiber 66 connecting the central office 62 to the upstream xDSL modem 74. Page 4, lines 6-8; page 7, lines 23-27.

With reference to Figure 3, claim 15 recites a broadband communication method 120 for xDSL packet-based applications. The method 120 comprises broadcasting from a point, over a twisted pair, with an upstream xDSL modem (block 122) and receiving at a plurality of points with a plurality of downstream xDSL modems (block 126). Each downstream xDSL modem is in communication with a corresponding tap of a plurality of taps defined along the twisted pair. The upstream xDSL modem and the plurality of downstream xDSL modems is configured to provide packet-based point-to-multipoint communication between the upstream xDSL modem and the plurality of downstream xDSL modems. Page 4, lines 9-17; page 8, lines 22-31; page 9, lines 1-2.

Claim 16 recites a method 120 wherein the upstream xDSL modem and the plurality of downstream xDSL modems are VDSL modems. Further, claim 17 recites the modems are configured for use in packet-switched network and claim 18 recites the method wherein the modems are configured for use in a cell-switched network. Page 3, lines 14-20, page 9, lines 3-9.

Claim 19 recites the method further comprising transmitting from the plurality of downstream xDSL modems to the upstream xDSL modem in a contention-based protocol.

Claim 20 recites similar method, but transmitting in a time division multiplexing-based protocol. Page 3, lines 21-23; page 9, lines 3-5; Figure 3, block 130.

In addition, claim 21 recites the method wherein broadcasting further comprises transmitting from the upstream xDSL modem to the plurality of downstream xDSL modems in a broadcast-based protocol. Page 3, lines 23-25; page 8, lines 25-27; Figure 3, block 124.

VI. ISSUES

1. Whether claims 1-6, 11-13, 15, 16, and 21 are anticipated under 35 U.S.C. §102(e) by Gultekin et al (U.S. Patent No. 6,215,793).

2. Whether claims 9, 10, 14, 19, and 20 are unpatentable under 35 U.S.C. §103(a) over Gultekin et al in view of Kaku et al (U.S. Patent No. 4,868,850).

3. Whether claims 7, 8, 17, and 18 are unpatentable under 35 U.S.C. §103(a) over Gultekin et al and Kaku et al, and further in view of Henderson et al (U.S. Patent No. 6,101,216).

VII. GROUPING OF CLAIMS

Claims 1-6, 11-13, 15, 16, and 21 stand or fall together.

Claims 9, 10, 14, 19, and 20 stand or fall together.

Claims 7, 8, 17, and 18 stand or fall together.

VIII. ARGUMENT

1. Claims 1-6, 11-13, 15, 16, and 21 - 35 U.S.C. §102(e)

Claim 1 recites a broadband communication system utilizing xDSL packet-based technologies. An upstream xDSL modem is connected to a twisted pair having a plurality of taps defined along the twisted pair. Each of a plurality of downstream xDSL modems is in communication with a corresponding tap of the plurality of taps. The upstream xDSL modem

and the plurality of downstream xDSL modems are configured to provide packet-based point-to-multipoint communication between the upstream xDSL modem and the plurality of downstream xDSL modems. Specifically, claim 1 recites, in combination with other limitations, point-to-multipoint communication. The prior art fails to suggest a twisted pair having a plurality of taps for point-to-multipoint xDSL communication with the other recited limitations.

Gultekin describes an initialization protocol that supports adaptation of data rates wherein the protocol contains a four phase process executed by a first and second transceiver over a communication link. The Examiner states that Gultekin suggests point to multipoint xDSL communication and directs Applicants' attention to Col. 1, line 29; Col. 5, lines 30-41; Col. 9, line 63-Col. 10, line 3; and Fig. 1. Applicants contend that Gultekin fails to suggest point-to-multipoint xDSL communication provided over a twisted pair communication link having a plurality of taps defined along the twisted pair.

Figure 1 clearly shows point-to-point communication between two TRX1 and TRX2. Col. 1 lines 27-29 specifically describes an and initialization protocol wherein the protocol is executed by an ADSL transceiver pair interconnected via a communication link such as a twisted pair copper telephone line. Col. 5, lines 30-41 describes communication between two ADSL modems, TRX1 and TRX2. And lastly, Col. 9, line 63-Col. 10, line 3 also fails to suggest point-to-multipoint xDSL communication. Col. 9, lines 63-67 does describe that two transceivers may negotiate a bidirectional data rate in an ADSL system. This section further states "or a unidirectional data rate (as in an HFC network for instance) wherein data are downstream broadcasted over a point-to-multipoint connection but wherein upstream transmission is done over a point-to-point channel whose data rate may be negotiated during initialization." This specific portion of Gultekin does mention point-to-multipoint connections, but it is describing a hybrid fiber coax (HFC) network and not made in reference to an xDSL system provided over a twisted pair communication link having a plurality of taps defined

along the twisted pair. There is no suggestion that the point-to-multipoint connection described for use with an HFC network is usable with an xDSL system, nor is there suggestion or motivation in the reference to do so.

In addition, the Examiner notes that Gultekin does not explicitly teach the tap, but provides an interface (tap) for each downstream xDSL modem, and communications between each xDSL modem and its corresponding interface for the point to multipoint communications are inherently required, because the line is shared by the plurality of downstream xDSL modems connected to the twisted pair copper telephone line. However, Gultekin does not teach point-to-multipoint communication over a twisted pair copper telephone line, but only describes, by example, use of a hybrid fiber coax as previously explained.

Applicants point out that Gultekin is an initialization protocol for adaptive data rates, and involves a pair of transceivers negotiating a data rate for future transmissions over a communication link between the pair of transceivers. There is no suggestion to add point-to-multipoint capabilities over a twisted pair having a plurality of taps defined along the twisted pair to the ADSL system of Gultekin, and there is no suggestion that the initialization protocol for adaptive data rates of Gultekin would even be usable in such a system. This tends to further support the fact that there is no motivation to modify Gultekin to achieve the claimed invention as recited by claim 1.

For reasons given, Gultekin fails to suggest the specific combination recited by claim 1. The copper pair in Gultekin is used in point-to-point ADSL and there is no teaching of point-to-multipoint over a twisted pair as claimed. The only point-to-multipoint described in Gultekin is applied in an HFC network. Claims 12 and 15 are independent claims that are believed to be patentable for similar reasons as given above with respect to claim 1. More specifically, claims 12 and 15 each recite, in combination with other limitations, providing

packet-based point-to-multipoint communication between the upstream xDSL modem and the plurality of downstream xDSL modems over a twisted pair communication link having a plurality of taps defined along the twisted pair. Claims 2-5, 11, 13, 16, and 21 are dependent claims and are also believed to be patentable.

In the final action, the Examiner argues that, with reference to col. 9, line 48 - col. 10, line 3, Gultekin teaches that the transceivers may negotiate a unidirectional data rate (as in an HFC network) wherein data is broadcasted downstream over a point-to-multipoint connection. The Examiner also contends that Gultekin teaches that the invention can be applied to a telephone line, a coaxial cable, an optical fibre link, a satellite link, and a radio link. Further, the Examiner states that Gultekin does not limit the point-to-multipoint communication to an HFC network, and therefore, the twisted pair is not excluded. Applicants disagree.

Col. 9, lines 48-62 merely discusses the interchangeability of the transmission medium which interconnects two transceivers. That is, the medium between TRX1 and TRX2, the transceiver pair, may take different forms. Nevertheless, the interchangeability of medium is discussed specifically with respect to the TRX1 and TRX2 initialization process only and applicants' invention is not suggested here.

Col. 9, lines 63-67 and Col 10, lines 1-3 also do not suggest applicants' invention. This section discusses using the initialization process for a unidirectional data rate, and mentions HFC as a suitable network for unidirectional data rate. But this only means that Gultekin's technique is useable for unidirectional as well as bi-directional applications. Gultekin teaches a protocol method useable for negotiating data rates in various applications. Col. 9, lines 48-62 discusses using his protocol to establish bidirectional data rate between TRX1 and TRX2, and discusses the use of various mediums. Col. 9, lines 63-67 and col. 10, lines 1-3 discuss downstream broadcasting over a point to multi-point connection and upstream

transmission over a point to point channel using the Gultekin protocol at initialization. But Gultekin only mentions point to multi-point briefly to suggest the use of his protocol for the upstream rate negotiation. There is no suggestion of point to multipoint communication over twisted pair. The Examiner states that Gultekin does not expressly limit point to multi-point communications to HFC. Applicant responds that Gultekin does not suggest the claimed invention. A twisted pair may have been discussed as a possible communication link in Col. 9, lines 48-62, but this does not mean that a twisted pair is suggested for any network architecture mentioned anywhere in Gultekin.

2. **Claims 9, 10, 14, 19, and 20 - 35 U.S.C. §103(a)**

Regarding the rejection of claims 9, 10, 14, 19, and 20 as being unpatentable over Gultekin et al in view of Kaku et al, these claims are dependent claims and are believed to be patentable for their dependency. Further, Kaku et al discloses a multipoint type modem communication system connected over a telephone line having a training means and a reduced training time. There is no suggestion of a twisted pair connected to xDSL modems for providing packet-based point-to-multipoint communication. There is no suggestion or motivation within the two references to combine or modify the disclosed features to show support or explanation of a point-to-multipoint xDSL communication provided over a twisted pair communication link having a plurality of taps defined along the twisted pair.

3. **Claims 7, 8, 17, and 18 - 35 U.S.C. §103(a)**

Regarding the rejection of claims 7-8 and 17-18 as being unpatentable over Gultekin and Kaku in view of Henderson, these claims are dependent claims and are also believed to be patentable for their dependency.

IX. SUMMARY

For the reasons given above, it is respectfully submitted that claims 1-21 are patentable. The final rejection of claims 1-21 should be reversed.

The fee of $330.00 as applicable under the provisions of 37 C.F.R. § 1.17(c) is enclosed. The fee of $420.00 for a two month extension of time is also enclosed (1.17(a)(2)). Please charge any additional fee or credit any overpayment in connection with this filing to our Deposit Account No. 02-3978.

Respectfully submitted,

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Enclosure - Appendix

IX. APPENDIX - CLAIMS ON APPEAL

1. A broadband communication system of the type utilizing xDSL packet-based technologies, the system comprising:

an upstream xDSL modem;

a twisted pair connected to the upstream xDSL modem;

a plurality of taps defined along the twisted pair;

a plurality of downstream xDSL modems, each downstream xDSL modem being in communication with a corresponding tap of the plurality of taps, the upstream xDSL modem and the plurality of downstream xDSL modems providing packet-based point-to-multipoint communication between the upstream xDSL modem and the plurality of downstream xDSL modems.

2. The system of claim 1 wherein the upstream xDSL modem and the plurality of downstream xDSL modems are VDSL modems.

3. The system of claim 1 wherein the twisted pair is an unshielded twisted pair.

4. The system of claim 1 wherein the twisted pair is a copper twisted pair.

5. The system of claim 1 wherein the twisted pair is a Category 3 twisted pair.

6. The system of claim 1 wherein the twisted pair is a Category 5 twisted pair.

7. The system of claim 1 wherein the upstream xDSL modem and the plurality of downstream xDSL modems are in a packet-switched network.

8. The system of claim 1 wherein the upstream xDSL modem and the plurality of downstream xDSL modems are in a cell-switched network.

9. The system of claim 1 wherein the plurality of downstream xDSL modems are operative to transmit to the upstream xDSL modem in a contention-based protocol.

10. The system of claim 1 wherein the plurality of downstream xDSL modems are operative to transmit to the upstream xDSL modem in a time division multiplexing-based protocol.

11. The system of claim 1 wherein the upstream xDSL modem is operative to transmit to the plurality of downstream xDSL modems in a broadcast-based protocol.

12. A broadband communication system of the type utilizing xDSL packet-based technologies, the system comprising:

a central office;

an upstream xDSL modem in communication with the central office;

a twisted pair connected to the upstream xDSL modem;

a plurality of taps defined along the twisted pair;

a plurality of downstream xDSL modems, each downstream xDSL modem being in communication with a corresponding tap of the plurality of taps, the upstream xDSL modem and the plurality of downstream xDSL modems providing packet-based point-to-multipoint communication between the upstream xDSL modem and the plurality of downstream xDSL modems.

13. The system of claim 12 wherein the upstream xDSL modem is located within the central office.

14. The system of claim 12 wherein the upstream xDSL modem is located outside of the central office, and the system further comprises:

a fiber connecting the central office to the upstream xDSL modem.

15. A broadband communication method for xDSL packet-based applications, the method comprising:

broadcasting from a point, over a twisted pair, with an upstream xDSL modem;

receiving at a plurality of points with a plurality of downstream xDSL modems, each downstream xDSL modem being in communication with a corresponding tap of a plurality of taps defined along the twisted pair, the upstream xDSL modem and the plurality of downstream xDSL modems providing packet-based point-to-multipoint communication between the upstream xDSL modem and the plurality of downstream xDSL modems.

16. The method of claim 15 wherein the upstream xDSL modem and the plurality of downstream xDSL modems are VDSL modems.

17. The method of claim 15 wherein the upstream xDSL modem and the plurality of downstream xDSL modems are in a packet-switched network.

18. The method of claim 15 wherein the upstream xDSL modem and the plurality of downstream xDSL modems are in a cell-switched network.

19. The method of claim 15 further comprising:

transmitting from the plurality of downstream xDSL modems to the upstream xDSL modem in a contention-based protocol.

20. The method of claim 15 further comprising:

transmitting from the plurality of downstream xDSL modems to the upstream xDSL modem in a time division multiplexing-based protocol.

21. The method of claim 15 wherein broadcasting further comprises:

transmitting from the upstream xDSL modem to the plurality of downstream xDSL modems in a broadcast-based protocol.